

In the claims:

Claim 1 cancelled.

2. (Currently amended) A method according to claim 415, wherein a frequency of a current flowing in the generator (7) is used as said state parameter.

3. (Currently amended) A method according to claim 415, wherein a phase displacement between a current and a voltage in said generator (7) is used as the state parameter.

4. (Currently amended) A method according to claim 415, wherein an electrical ultrasonic power (P) generated by the generator (7) is used as the state parameter.

Claim 5 cancelled.

6. (Currently amended) Apparatus according to claim 516, wherein a frequency of a current flowing in the generator (7) is said state parameter.

7. (Currently amended) Apparatus according to claim 516, wherein a phase displacement between a current and a voltage in said generator (7) is said state parameter.

8. (Currently amended) Apparatus according to claim 516, wherein an effective power (P) generated by the generator (7) is the state parameter.

Claim 9 cancelled.

10. (Currently amended) Apparatus as defined in claim 917, wherein said switch-off signal can be generated when said state parameter (P) deviates by a predetermined amount from an average value which occurs during a processing interval recognized as usable between predetermined instants of time.

Claims 11-12 cancelled.

13. (Currently amended) Apparatus according to claim ~~42~~19, wherein said contact surface (32a) of said sonotrode (3) is chosen larger than

is at least necessary for carrying out ~~the~~ processing during the processing cycles.

Claim 14 cancelled.

15. (New claim) A method for connecting two workpieces (33, 34; 53, 54) to each other by ultrasonic welding, comprising the steps of: using a vibratory structure (1) having a sonotrode (3, 57), a convertor (2) and an ultrasonic generator (7) for supplying ultrasonic energy to said converter (2) ; providing said two workpieces (33, 34; 53, 54) which are to be connected and a piece (35, 60) of a meltable material for welding said workpieces to each other; moving said sonotrode (3, 57) into a direction of one of said workpieces (34, 54); starting a welding process by switching on said ultrasonic generator (7) for setting at least said sonotrode (3, 57) into mechanical vibrations for melting said piece (35, 60); determining a state parameter being representative for a contact between a face (32) of said sonotrode (3) and said one of said workpieces (34) or between both said workpieces (53, 54) as a result of said movement of said sonotrode (3, 57); and terminating said welding process by switching off said ultrasonic generator (7) when said state parameter deviates by a predetermined amount from a preselected value as a result of said contact.

16. (New claim) Apparatus for connecting two workpieces (33, 34; 53, 54) to each other by ultrasonic welding and by means of a piece (35, 60) of a meltable material, comprising: a vibratory structure (1) having a sonotrode (3, 57), a converter (2) and an ultrasonic generator (7) for supplying ultrasonic energy to said converter (2); means for moving said sonotrode (3, 53) into a direction of one of said workpieces (34, 54); means (24) starting a welding process by switching on said ultrasonic generator (7) for setting at least said sonotrode (3, 57) into mechanical vibration and for melting said piece (35, 60); means (17, 18, 42, 43) for determining a state parameter being representative for a contact between a face (32) of said sonotrode (3) and said one of said workpieces (34) or between both said workpieces (53, 54) as a result of said movement of said sonotrode (3, 57); and means (25, 44-51) coupled with said determining means (17, 18, 42, 43) for terminating said welding process by switching off said ultrasonic generator (7) when said state parameter deviates by a predetermined amount from a preselected value as a result of said contact.

17. (New claim) Apparatus according to claim 16, wherein said terminating means (25, 44-51) issues a switch off signal when said state parameter deviates by a predetermined amount from values which it can assume during a welding process duration recognized as usable.

18. (New claim) Apparatus according to each of claims 9 and 17, wherein said terminating means (25, 44-51) can in each case be activated only a predetermined length of time (t_4) after switching on (t_0) said generator (7).

19. (New claim) Apparatus according to claim 16, wherein said generator (7) can be switched off in spot, rivet or stud welding at instants in time (t_5) which correspond to contact of said surface (32) to said workpiece (34).

20. (New claim) Apparatus according to claim 16, wherein said generator (7) can be switched off in surface welding with said pieces (60) being designed as energy directors at instants in time which correspond to contact between both said workpieces (53, 54).

21. (New claim) A method for ultrasonic processing of workpieces (33, 34; 53, 54) with a vibratory structure (1) comprising a sonotrode (3, 57) and a converter (2), wherein ultrasonic energy is supplied to the convertor (2) by means of an ultrasonic generator (7), which is switched on and off by electrical switch-on and switch-off signals respectively, only for the duration of processing cycles, characterized in that

the switch-off signals are generated on the basis of at least one state parameter (P) of the generator (7), wherein a frequency of a current flowing in the generator (7) is used as said state parameter.

22. (New claim) A method for ultrasonic processing of workpieces (33, 34; 53, 54) with a vibratory structure (1) comprising a sonotrode (3, 57) and a converter (2), wherein ultrasonic energy is supplied to the converter (2) by means of an ultrasonic generator (7), which is switched on and off by electrical switch-on and switch-off signals respectively, only for the duration of processing cycles, characterized in that the switch-off signals are generated on the basis of at least one state parameter (P) of the generator (7), wherein a phase displacement between a current and a voltage in said generator (7) is used as the state parameter.

23. (New claim) Apparatus for ultrasonic processing of workpieces (33, 34; 53, 54), comprising: a vibratory structure (1) having a sonotrode (3, 57) and an electromechanical converter (2), a generator (7) connected to said converter (2) and adapted to supply ultrasonic energy, means (24, 25) for generating switch-on and switch-off signals for said generator at the start and end respectively of processing cycles, and at least one output means (17, 18 or 43) for providing a selected electrical state

parameter (P) of said generator (7), wherein said switch-off signals can be generated on the basis of the at least one state parameter (P), wherein a frequency of a current flowing in the generator (7) is said state parameter.

24. (New claim) Apparatus for ultrasonic processing of workpieces (33, 34; 53, 54) , comprising: a vibratory structure (1) having a sonotrode (3, 57) and an electromechanical converter (2), a generator (7) connected to said converter (2) and adapted to supply ultrasonic energy, means (24, 25) for generating switch-on and switch-off signals for said generator at the start and end respectively of processing cycles, and at least one output means (17, 18 or 43) for providing a selected electrical state parameter (P) of said generator (7), wherein said switch-off signals can be generated on the basis of the at least one state parameter (P), wherein a phase displacement between a current and a voltage in said generator (7) is said state parameter..